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ABSTRACT

Materials in this teaching unit are designed to foster an interest in whale preservation among intermediate grade and junior high school students. Several readings provide background information on various types of whales and the economic value of whales. Student activities include a true and false game, a crossword, and a mobile. A resource list cites organizations, and resource and general interest books on the subject. An outline of additional activities for use in language arts, science, math, social studies, art, and music classes completes the packet. (LP)

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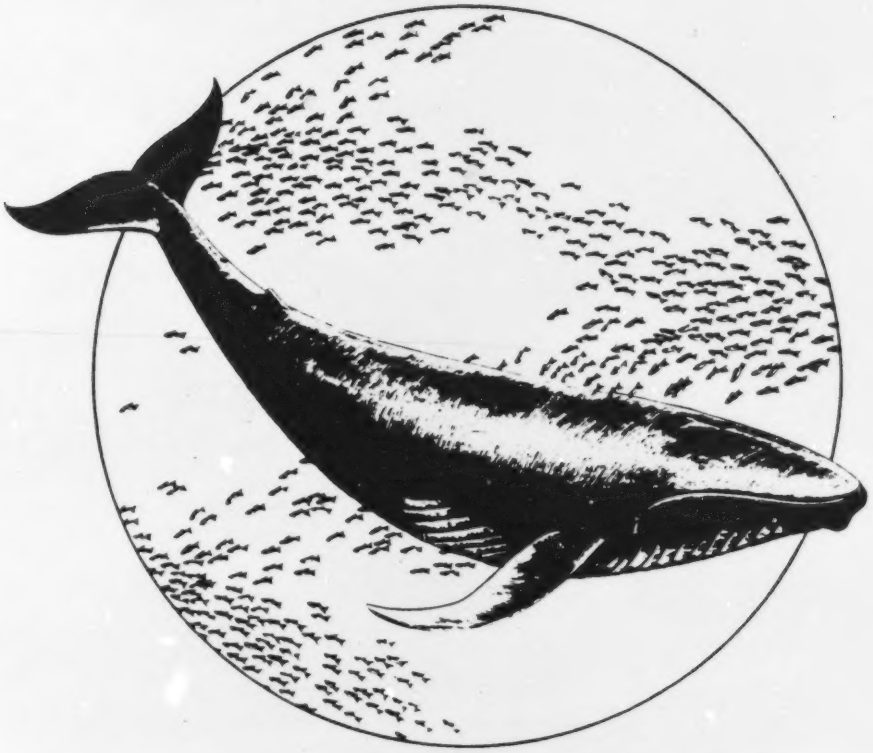
Peninsula Humane Society

Whale Teaching Unit



Peninsula Humane Society
12 Airport Blvd.
San Mateo, CA 94401
573-3719

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PENINSULA HUMANE SOCIETY

A NON-PROFIT ANIMAL WELFARE ORGANIZATION SERVING ALL OF SAN MATEO COUNTY

12 AIRPORT BOULEVARD SAN MATEO, CALIFORNIA 94401

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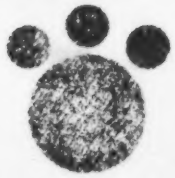

Dear Teacher:

I hope you and your class enjoy learning about the wonderful whales. There are many areas about cetaceans that your students will be able to explore. Our Whale Teaching Unit has activity suggestions, resource list, crossword puzzles and many more activities.

PURPOSE OF THE UNIT: The purpose of the Whale Teaching Unit is to create a genuine interest in, and respect for whales, which will hopefully result in more individuals being concerned about, and willing to aid in the preservation of the species.

LEARNING OBJECTIVES:

1. Students will be able to make comparison between cold-blooded and warm-blooded, giving an example of each
2. Students will be able to contrast the two types of whales and give an example of each
3. Students will be able to identify a minimum of three whales and give a couple of features, facts, or characteristics of each.
4. Students will be familiar with the whales value in the economic world, why many types of whales are endangered and why they must be protected.
5. Students will be able to understand the similarities between whales and people
6. Students, hopefully, will gain a feeling of sensitivity and responsibility towards whales.

If you and your class are interested in pursuing your research on whales, please give me a call at 573-3719 for more information. The Education Department has a couple of filmstrips on whales and you are welcome to borrow them.

Sincerely,

Kim Sturla

KIM STURLA
Education Coordinator

WHALE RESOURCES

ANIMAL WELFARE INSTITUTE P.O. Box 3650 Washington D.C. 20007	Information on whales available. Write for catalogue
CALIFORNIA MARINE MAMMAL CENTER Marine Headlands Ranger Station Building 1050 Fort Cronkhite, CA 94965 561-7284	Information on marine mammals. Tours and guest speakers
GENERAL WHALE P.O. Box Save The Whale Alameda, CA 94501	Literature, charts, and teaching materials on whales. Also complete whale teaching aids for teachers
GREENPEACE Fort Mason Building E San Francisco, CA 94123 474-6767	Literature on the plight of the whale and harp seal. Speakers and films available upon request
MARINE MAMMAL FUND 4421 Lincoln Way San Francisco, CA 94122 664-6665	Film "Last Day of the Dolphins" available for loan. Literature on whales
WHALE CENTER 3929 Piedmont Ave. Oakland, CA 94611 654-4892	Literature on whales
Jenie McNaughton Box 355 Bolinas, CA 94924 868-0149	Provide in-school programs on whales. The "Whale Bus" is affiliated with the Whale Center
Oceanic Society 240 Fort Mason San Francisco, CA 94123 441-5970	Whale watching trips.during the winter months. Contact for more information
PENINSULA HUMANE SOCIETY 12 Airport Blvd. San Mateo, CA 94401 573-3719	Literature on whales, Teacher's Packet on whales, filmstrip available for free loan to teachers

WHALES: SUGGESTED READING LIST

RESOURCE BOOKS

WHALES a Small World Book; Gloucester Press - N.Y.; 1979; 28 pgs.; ages 8 & up

Describes the various whales of the world, showing the similarities and dissimilarities between the different species of whales.

THE GREAT WHALES by Herbert S. Zim; William Morrow & Company - N.Y.; 1951; 60 pgs.; ages 7 - 9

Do whales have hair? How deep can they dive? Do they see and hear under water? What enemies do they fear? Here all the facts about these giant mammals, simply explained in large bold 24 point type and detailed pencil drawings.

WHALES by Helen Hoke & Valerie Pitt; Franklin Watts, Inc. - N.Y.; 1973; 90 pgs.; ages 12 & up

Clearly describes the characteristics and habits of whales and the distinctive features of individual sub-species, including dolphins and porpoises. Includes many photographs and illustrations which will help the intermediate reader to better understand the world of whales.

WHALES: FRIENDLY DOLPHINS & MIGHTY GIANTS OF THE SEA by Jane Werner Watson; Golden Press - N.Y.; 1975; 61 pgs.; ages 10 & up

Picturesque book with information pertaining to the different whales. Includes a good chapter on whales and people.

WHALES: THEIR LIFE IN THE SEA by Faith McNulty; Harper & Row - N.Y.; 1975; 88 pgs.; ages 12 & up

Explains the whale's life in a watery world, how they communicate across great distances, how they care for their young, and how each year they make extraordinary journeys from polar ice to the warm equator. The author ends with a plea to save the whales from extinction. Very informative, but not heavily illustrated.

THE BLUE WHALE by Kazue Mizumua; Thomas Y. Crowell Company - N.Y.; 1971; 33 pgs.; (This is a Let's-Read-And-Find-Out Science Book) ages 7 & up

Describes how the blue whale lives, how it feeds, how mothers care for their young, and how whales are threatened by people.

BOOKS TO READ ALOUD (fiction and non-fiction)

KILLER WHALE: MAMMAL OF THE SEA by William & Peggy Stephens; Holiday House - N.Y.; 1971; 48 pgs.; ages 8 & up

The story of a young killer whale growing up off the California coast.

KILLER WHALES by Seymour Simon; J.B. Lippinscott Company - N.Y.; 1978; 96 pgs; ages 11 & up

Killer Whales have a reputation for being dangerous creatures. But are they really? Read the true stories behind some of the myths that developed about Killer Whales. Also, meet famous Killer Whales which have been kept in captivity such as: Moby Doll, Shamu, and Hyak. Illustrated with true photographs.

JOURNEY OF THE GRAY WHALES by Gladys Conklin; Holiday House - N.Y.; 1974; 39 pgs.; ages 10 & up

Every year the California Gray Whales travel southward, along the California coast, to give birth to their young. The reader is allowed to experience this birth and join in the long journey back to the Bering Sea.

WHALE WATCH by Ada & Frank Graham; Delacorte Press - N.Y.; 1978; 120 pgs.; ages 12 & up

Discusses the whale, the industry which has slaughtered it almost to extinction and the efforts to sustain its survival.

SEA FULL OF WHALES by Richard Armour; McGraw Hill Book Company - N.Y.; 1974; 32 pgs.; ages 10 & up

This book, in rhymed form, tells of the ancestory of whales. A thoroughly enjoyable and picturesque book.

LITTLE CALF by Victor B. Scheffer; Charles Scribner's Sons - N.Y.; 1970; 140 pgs.; ages 13 & up

Month by month, through the full circle of the year, the reader follows the adventures of the Little Calf; and in the process learns about the birth and death of whales, their migrations, their courtship, and the fierce battles they wage in the sea.

THOR: LAST OF THE SPERM WHALES by Robert M. McClung; William Morrow & Company - N.Y.; 1971; 64 pgs.; ages 7 - 10

The author follows the life cycle of a Sperm Whale, named Thor, from his birth in the warm waters of the tropical Pacific to his near death by an explosive harpoon.

IN SEARCH OF A WHALE (a Marlin Perkin's Wild Kingdom Book) by Allan W. Eckert; Doubleday & Company, Inc. - N.Y.; 1970; 158 pgs.; ages 12 & up

The author takes the reader on a fascinating voyage during which Marlin Perkins helps to catch a whale for the collection at Marineland of the Pacific. It is a trip filled with adventure, and along the way the reader will learn a great deal about those largest-of-all-animals, the whales.

NAMU (a National Geographic Book) by Ronald M. Fisher; 1973; 32 pgs.; ages 7 - 10

Tells the true story of scientists making friends with a Killer Whale, named Namu. Filled with beautiful color photographs.

MOTHER WHALE by Edith Hurd; Little, Brown & Company - Boston; 1973; 32 pgs.; age 5 - 7

Describes the cycle in which the mother whale gives birth, nurtures and raises their single offspring and then mates again.

THE WHALES GO BY by Fred Phleger; Random House - N.Y.; 1959; 62 pgs.; ages 5 - 7

In simple language the reader will learn the basics of whale behavior and habits.

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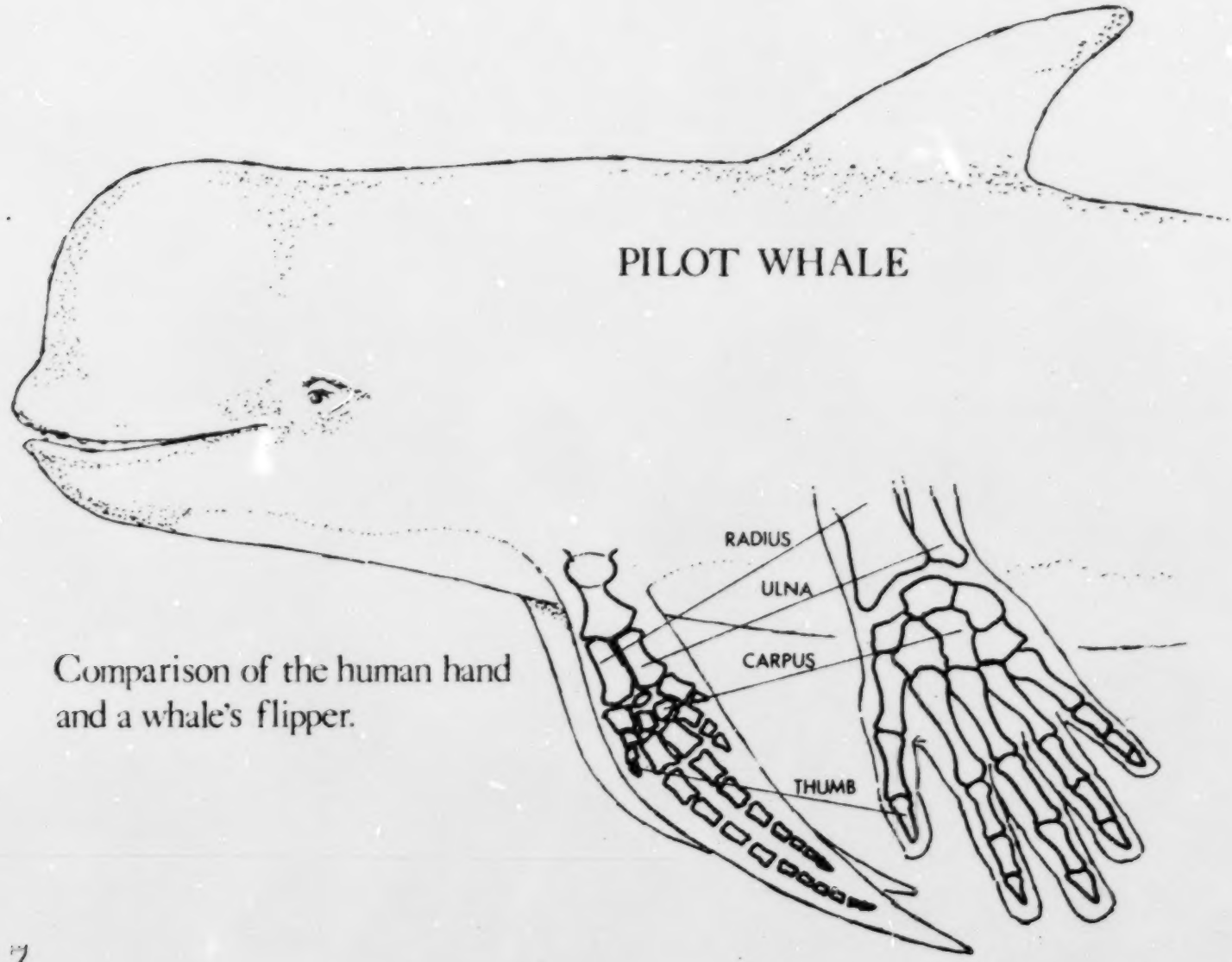
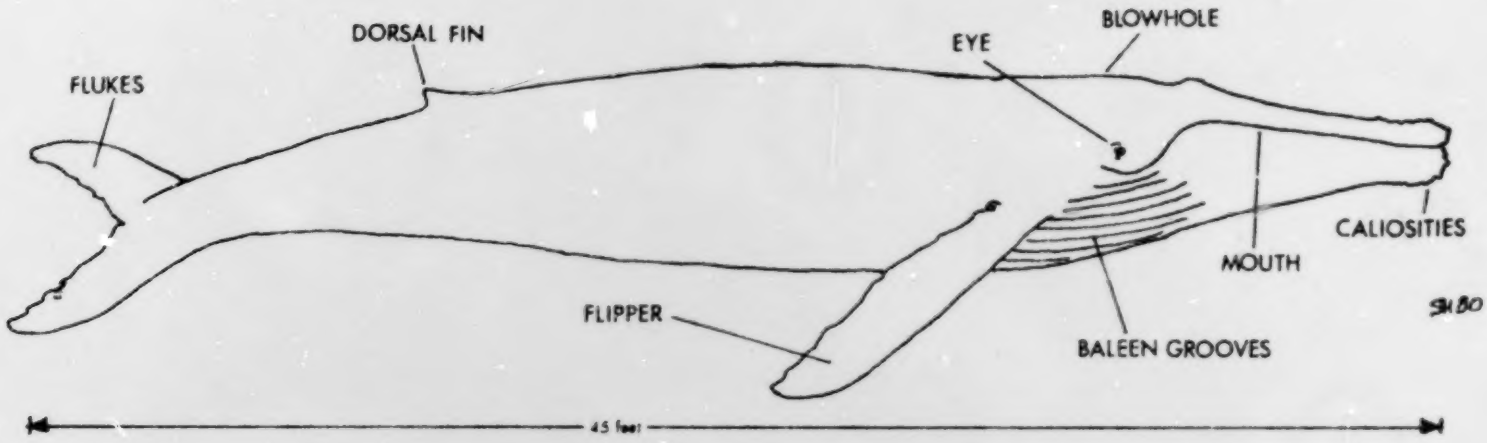


Comparison of the human hand and a whale's flipper.

BLUEPRINT OF A HUMPBACK WHALE



WHALES IN GENERAL

Cetology (se-tol'o-ji) is the study of whales, dolphins and porpoises. *Cetos* is Greek for whale. Cetologists divide all cetaceans into two groups: those with teeth (odontoceti) and those without (mysticeti).

MYSTICETI (mustache-whale, referring to the baleen, which may have resembled a mustache to the ancient Greeks)

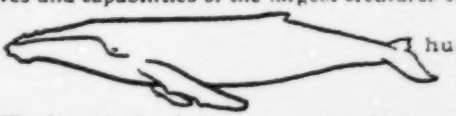
There are 10 species of baleen whales. These whales feed by sieving water through their baleen, which is a biologically ingenuous arrangement of flexible blades that are smooth on the outside edge but fibrous on the inside and are positioned around the outer edge of the whale's upper jaw. The baleen makes it possible to gather tons of the minute food creatures upon which these whales, the largest of all animals, feed. Water will pass through the baleen but whale food will not.

bowhead whale

The bowhead whale lives only around Greenland and Alaska. It was hunted so relentlessly that the last ship to sail to the arctic in search of bowhead whales stayed out two years and came back empty. Today the magnificent bowhead whale is not extinct, but rare.

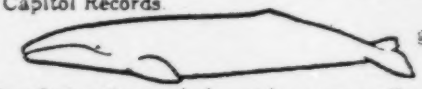
right whale

The right whale has also been greatly reduced in numbers and is nearly extinct in the northern hemisphere. In the southern hemisphere, in Patagonia, there is a small group of right whales that spend part of the year in certain bays, in shallow water close to the beach. There they have been carefully studied and much information on natural behavior has been recorded ("At Home with Right Whales" National Geographic, March 1976). This is significant in that so little is actually known about the lives and capabilities of the largest creatures on earth.



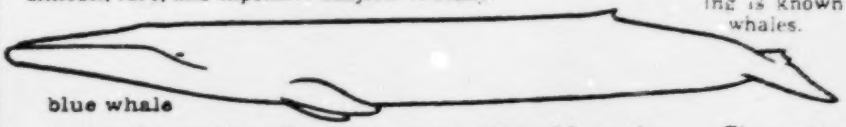
humpback whale

The humpback whale's songs, some 20 minutes long and then repeating, are astonishing and hard to believe at first. The sounds range from clicks and grunts to beautiful ethereal squeals. And the humpie is distinguished by being the only animal to have two hit records. *Songs of the Humpback Whale* and *Deep Voices*, both on Capitol Records.



gray whale

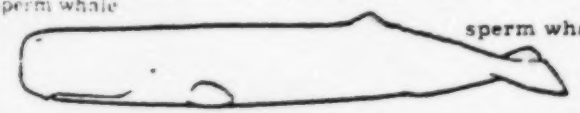
Another unique whale, with a genus all to itself, is the gray whale. They swim from Alaska, where they feed during the summer months, to Baja California, where they calve and mate during the winter. This distance is over 15,000 kilometers (8,000 miles) round trip. It is one of the longest migrations of any mammal. In some places they swim quite close to land, in fact, just beyond the surfline. This whale is easier to see than most and much information on its biology and behavior is now being gathered. It remains true, however, that whales are extremely difficult, rare, and expensive subjects to study.



blue whale

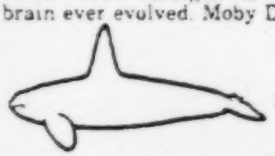
Among the mysticeti there is a special group of long, thin streamlined whales known as rorquals. They are beautiful and graceful animals, the fastest of which can swim over 30 kilometers (19 miles) an hour. In water this is very fast. Rorqual's food gathers in swarms, like the five centimeter (two-inch) shrimp-like animals called krill and small schooling fish. Krill is the favorite food of the largest of all whales, the blue whale. The thin, sleek rorqual whale approaches the food and takes a giant mouthful that blows its throat and chest out like the world's largest beach ball! The mouth is then closed and the water "squished" through the baleen. What is left is whale food.

ODONTOCETI (These whales have teeth. All porpoises and dolphins are in this group.) The largest toothed whale is the sperm whale.



sperm whale

Sperm whales can stay submerged for over an hour and the large males, feeding on deep sea squid, may dive to over 915 meters (3,000 feet) straight down! Sperm whales have the largest brain ever evolved. Moby Dick was a sperm whale.



killer whale

Orcas or killer whales are among the largest odontocetes. As do sperm whales, some orcas roam the seas in close family groups with a large male (presumably) as the leader. Orcas feed mainly on fish but also catch seals, sea lions, dolphins, and small whales and even attack large whales. Orcas have been kept in aquariums where it was discovered that the mighty orca is gentle, cooperative, curious, and intelligent. Many believe they are the smartest of cetacea. There is no dependable record of orcas attacking humans, although they certainly have had ample opportunity.

bottlenosed dolphin

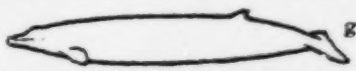
harbor porpoise

The bottlenose dolphin is well known from aquariums. There dolphins do well in captivity and many successive captive-born generations are now in progress.

Porpoises, as do dolphins, enjoy a diet of fish and squid. The body differences of the porpoises compared to the typical dolphin can be described. First, the porpoise does not have a beak, it has a more blunt face. And porpoises do not have a large, sharply hooked dorsal fin, as most dolphins do. And there are teeth and skeletal differences too.

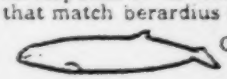
susu

One of the smallest dolphins, the susu, is only 1.5 meters (five feet) long, and lives in India's Ganges River. The water is obscure but the dolphins' hearing is so advanced they can "see with their ears" and catch all the fish they need.



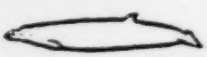
giant bottlenose whale

One more group of whales must be mentioned - the beaked whales. They are a separate group of odontocetes that are strange in appearance and little known in nature. The largest is the 13 meter (40-foot) bottlenose whale, or berardius. The males have two rather strange, obtuse teeth at the tip of the lower jaw. These teeth are presumably used in adjusting berardius mating or territorial disputes, as the males are covered with long shallow scratches that match berardius teeth.



Cuvier's beaked whale

Cuvier's beaked whale is another interesting looking whale of the ziphid group. It has very small flippers, and, as in other beaked whales, has little or no notch in the tail. Practically nothing is known about the living habits of these strange little whales.



strap-toothed whale

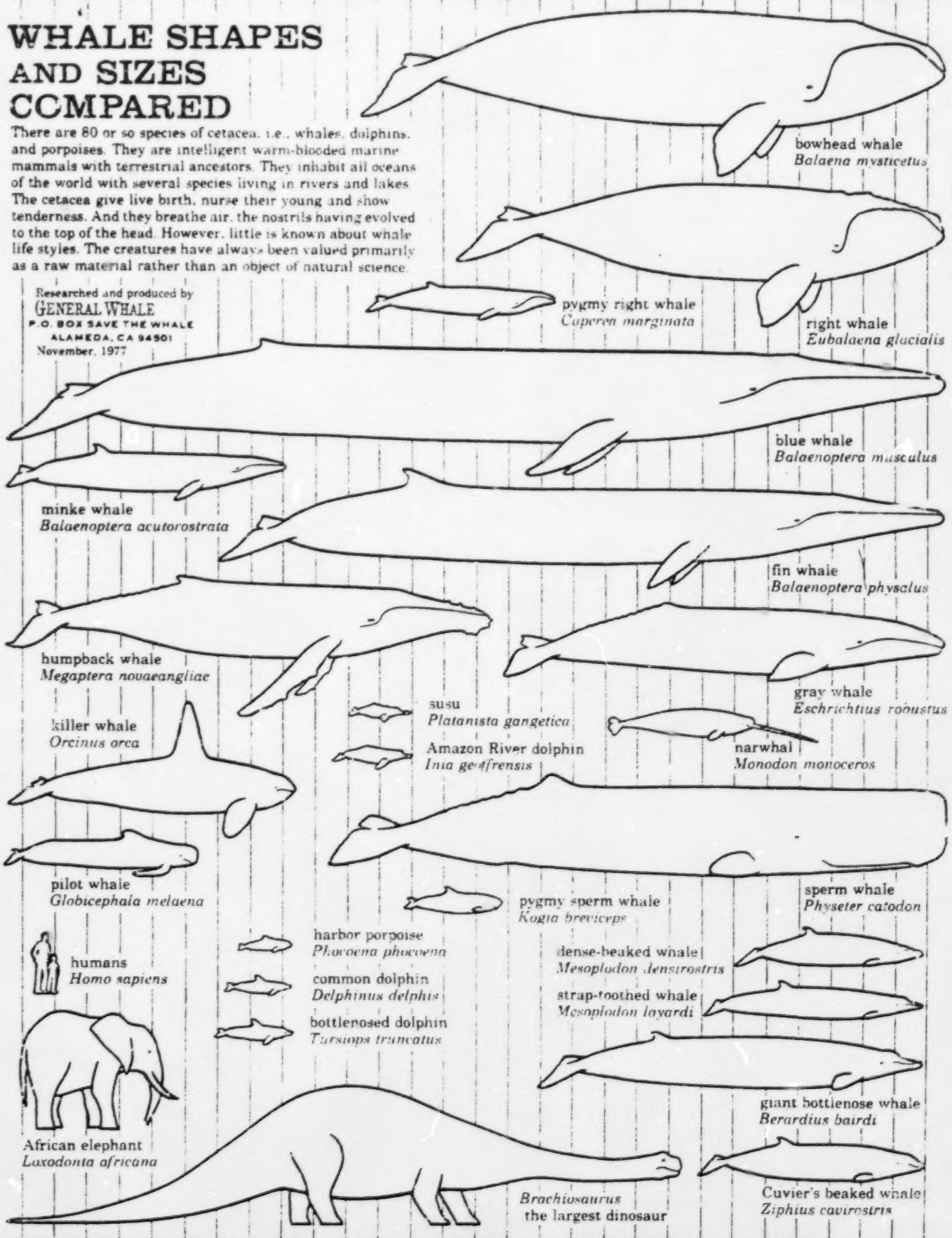
There are several species of mesoplodons which are the strangest and least known of all cetacea. Many mesoplodon species have not even been seen alive, and are known only from strandings or fortuitously discovered bone fragments.

GENERAL WHALE
Non-profit whale education
P.O. BOX SAVE THE WHALE
ALAMEDA, CA 94501
(415) 483-0194

WHALE SHAPES AND SIZES COMPARED

There are 80 or so species of cetacea, i.e., whales, dolphins, and porpoises. They are intelligent warm-blooded marine mammals with terrestrial ancestors. They inhabit all oceans of the world with several species living in rivers and lakes. The cetacea give live birth, nurse their young and show tenderness. And they breathe air, the nostrils having evolved to the top of the head. However, little is known about whale life styles. The creatures have always been valued primarily as a raw material rather than an object of natural science.

Researched and produced by
GENERAL WHALE
P.O. BOX SAVE THE WHALE
ALAMEDA, CA 94501
November, 1977



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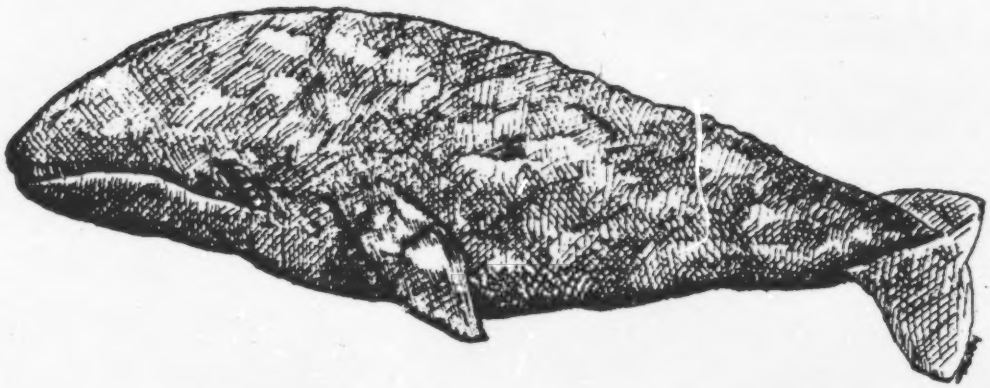

GRAY WHALES

Eschrichtius gibbosos

IDENTIFICATION: Medium size, baleen whale (filter feeder), and rather slender. Length is approximately 45 feet. Weight is 17 to 37 tons. Coloration is blotched, grayish-black; whitish patches (which are actually caused by barnacles that cling to the whales back). Spouts are quick and low (about 10 feet high). Their baleen plates may be more than a foot long.

RANGE & HABITAT: Range along the Pacific Coast. Migrates southward from Alaska in later part of December to February; returns in March and April after about 3 months in breeding waters in Baja California, Mexico.

DIET: They feed during their migration northwards. Feed on bottom-dwelling, shrimp-like creatures, small fish and sea cucumbers. They strain these small animals from the sea water with rows of fringed, baleen plates lined around the roof of their mouths.

STATUS: Protected. Was thought commercially extinct in late 1800s. In 1938 an International Treaty was signed to protect it.

REPRODUCTION: Attain sexual maturity at 8 to 9 years. Gestation period is 12 months. Females give birth in warmer southern waters and there they suckle their young. They mate again soon after giving birth.

ENEMIES: Killer whales (orcas)

OTHER INFORMATION: They swim in large groups of several hundred. The females travel with calves in distinct groups. Rather slow moving, traveling about 4 to 5 miles an hour, but can attain a speed of 10 miles an hour. Gray whales have the longest migration route of any mammal on earth - 12,000 miles round trip! They feed in the Arctic Ocean and Bering Sea for about 4 months

and then begin a 6,000 mile, 3 month trip to Baja California, Mexico to mate or give birth; they spend about 2 months in the lagoons or shallow waters off Baja and then begin the trip back to the Arctic Ocean.

OBSERVATION: Gray whales begin passing California at the end of November. December and January are the best months for observation. They can be easily seen from shore since they follow coastal, shallow waters. They can then be seen returning north from early March until the end of April. When "whale watching" look for the gray's "blow" which is 10 to 12 feet high and easily visible.

Prepared By: Peninsula Humane Society
12 Airport Blvd.
San Mateo, Ca. 94401

A LETTER FROM A WHALE

Dear Friend,

You don't know me and we may never meet. Your father knew me ever so slightly and his father, your grandfather, knew me a little bit better. But your great grandfather knew me well.

Your great grandfather and other men of his time chased me around the world. He made up songs and stories about me. He even called me a monster!

Your great grandfather hunted my brothers and me. He killed many of my brothers and sisters. Then he would cut them up in little pieces and boiled them. He used the oil from their bodies to light his lamps.

You know, your great grandfather was a disagreeable character but I still admired him - a little. He and his fellow sailors would chase me through the swiftly moving waters in large sailboats. When they got close, a few of them would get into a small wooden boat and row after me. Then they tried to kill me with woodenhandled spears. Sometimes they would spend more than two years at sea chasing my brothers and me.

But then everything changed. Your grandfather and the sailors of his time began to use cannons to shoot their spears. They built gigantic metal ships to use in the hunts. Your grandfather and his shipmates were good at their job. They killed off a lot of my brothers and sisters.

Now it's your father's turn. He uses fancy electronic equipment to find us. And he does the dirty work much faster then your grandfather.

It used to be that I could sing my song and thousands of my brothers and sisters could hear me humming in the water. Today when I sing, my song is no longer heard. Most of my brothers and sisters are gone, thanks to your great grandfather, his son, and your father.

I can't understand why they still hunt us. Everything that you people used to make from whale parts can now be made easier and cheaper with man-made things like plastic and steel.

Did you know that your grandmother used to make herself look thin by wearing a wide belt around her middle filled with thin whale bones? Strange, isn't it? Imagine killing a huge whale so that someone can look thinner.

Do you think that maybe, just maybe, you could help us out? We need a place to hide. We're sort of hoping that the whale hunters will give up if they can't find us. Maybe you've got a better idea? Please write back to me, but there is one small problem. You will not be able to send your letter to me. You see, I have to change my address a lot these days. I'll have to send a special person to pick them up for me. Or better yet, why don't you have your teacher send them to the Peninsula Humane Society and they'll make sure that I get them. Hope to hear from you real soon!

Very truly yours,

A BLUE FRIEND

Reprinted from KIND magazine - Humane Society of the United States

Petition For A Moratorium On Commercial Whaling

In 1972 the United Nations recommended a ten-year moratorium on the commercial killing of whales. No scientist can be sure of the numbers of whales, and whales are being hunted on the basis of guesses rather than facts. Only fourteen nations are engaged in commercial whaling and in each nation it is a minor industry. Stopping the killing of whales now will provide a chance for some species to recover.

We the undersigned support this petition for a moratorium on commercial whaling:

	Signature:	Address:
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Please Return To: Peninsula Humane Society
Education Department
12 Airport Blvd.
San Mateo, CA 94401

WHALE TRUE/FALSE GAME

The attached activity is a Whale True/False Game developed by Beverly Armstrong. This activity can be a class project or an individual student activity. Each whale square needs to be cut and glued to a 3x5 card. The students can do this for the teacher. Coloring the drawings is optional.

Materials Needed:

3 x 5 cards (30)
Scissors
Glue
Color crayons or colored pencils

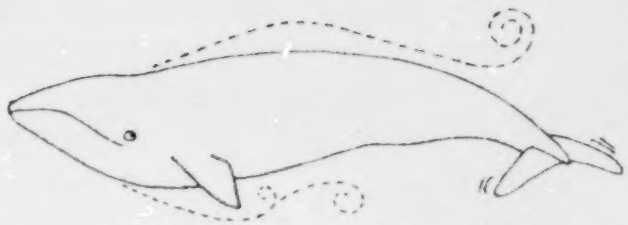
How To Play:

- Pass out a card to each student and ask them to think about what the right response is.
- Call upon each student individually and ask them to read their question aloud and then respond with a true or false answer.
- After each student has read their card and given their answer, the teacher should then read the answer from the teacher's answer sheet.
- This game can also be played with teams. Divide the class into Team A and Team B and keep score.
- It is important that you do not make the student feel self-conscious about responding "true" or "false" in front of the class. Stress to your students that most adults cannot properly answer all the questions.

Have fun with this game. It has been one of our most popular activities. If you are interested, we also have a True/False game on Dogs, Cats, Horses, and Reptiles.

WHALE TRUE·FALSE GAME

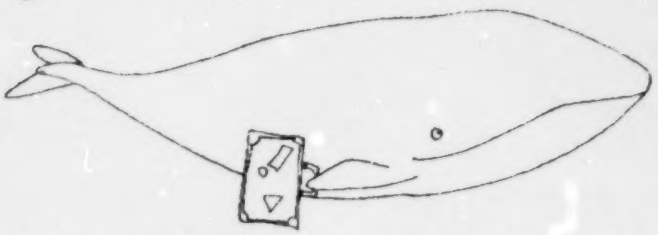
1. FALSE· THE HORIZONTAL FLUKES ARE PUMPED UP AND DOWN, PROPELLING THE BODY FORWARD.
2. TRUE· THE OILY TEARS PROTECT THE EYES FROM SALT WATER.
3. TRUE· THEY MAKE A ROUND TRIP FROM THE ARCTIC TO BAJA CALIFORNIA, WHERE THE CALVES ARE BORN.
4. FALSE· THEY TAKE SHORT NAPS FLOATING AT THE SURFACE OF THE WATER, WITH BLOWHOLES EXPOSED TO THE AIR.
5. FALSE· IT IS EXPELLING AIR, WHICH HAS BEEN HELD IN THE LUNGS. THIS WARMED AIR CONDENSES AND FORMS A VAPOR WHEN IT MEETS THE COLDER OUTSIDE AIR - THE SAME THING THAT HAPPENS WHEN WE EXHALE IN COLD WEATHER.
6. TRUE· THEY PURSUE THEIR FOOD BY SIGHT AND SOUND.
7. FALSE· THE WHALES' WORST ENEMY IS MAN.
8. TRUE· WHALES NEED WATER TO SUPPORT THE GREAT BULK AND WEIGHT OF THEIR BODIES. WITHOUT THIS SUPPORT, THE LUNGS ARE CRUSHED.
9. TRUE· AT 25 FEET LONG, IT IS THE WORLD'S LARGEST BABY!
10. FALSE· WHALES LIVE IN ALL THE WORLD'S OCEANS; MANY LIVE IN THE ARCTIC AND ANTARCTIC REGIONS.
11. TRUE· THE LAYER OF BLUBBER, LOCATED BETWEEN THE SKIN AND MUSCLE OF A WHALE'S BODY, CAN BE UP TO 20" THICK IN THE COLD-WATER SPECIES.
12. FALSE· "SOUNDING" MEANS DIVING, AND REFERS TO THE WHALES' DEEP DIVES.
13. FALSE· THE GREAT BLUE WHALE IS THE LARGEST ANIMAL THAT EVER LIVED - LARGER THAN ANY DINOSAUR.
14. TRUE· THE WHALES' ANCESTORS WALKED THE EARTH ON FOUR LEGS MILLIONS OF YEARS AGO. NOW ALL THAT REMAINS OF THE HIND LIMBS ARE SMALL THIGH & PELVIC BONES DEEP INSIDE THE BODY.
15. TRUE· THE HERDS ARE ALSO CALLED PODS, OR GAMS.
16. FALSE· THEY WEIGH UP TO 150 TONS!
17. TRUE· THE BLUE WHALE HAS A VERY TALL, THICK SPOUT; THE RIGHT WHALE'S SPOUT IS DIVIDED AT THE TOP; THE FINBACK'S SPOUT IS A THIN, HIGH COLUMN; THE HUMPBACK SPOUTS A LOW, ROUNDED CLOUD; THE SPERM WHALE SPOUTS A LOW, BUSHY PUFF FORWARD AND UPWARD.
18. FALSE - THE BRAINS OF WHALES ARE LARGE AND HEAVILY CONVOLUTED, INDICATING GREAT INTELLIGENCE.
19. TRUE· LIKE ANY OTHER AIR-BREATHING MAMMAL, THE WHALE WILL DROWN IF IT REMAINS UNDER WATER FOR TOO LONG A TIME.
20. TRUE· THE BLOWHOLE CONNECTS DIRECTLY WITH THE LUNGS. THIS ENABLES THE WHALE TO OPEN ITS MOUTH UNDER WATER WITHOUT TAKING WATER INTO THE LUNGS.
21. FALSE· THERE ARE TWO MAIN TYPES OF WHALES: TOOTHED WHALES AND BALEEN WHALES. INSTEAD OF HAVING TEETH, THE BALEEN WHALES HAVE MANY THIN PLATES OF SIEVE-LIKE BALEEN IN THEIR MOUTHS, AND THEY USE THESE PLATES TO STRAIN THEIR FOOD FROM THE WATER.
22. TRUE· IT IS ALSO USED IN PET FOODS.
23. FALSE· THE BLUE WHALE IS A BALEEN WHALE, AND IT LIVES ON TINY SHRIMP CALLED KRILL; IT ONLY NEEDS A SMALL THROAT OPENING TO SWALLOW ITS FOOD. THE SPERM WHALE IS A TOOTHED WHALE AND IT EATS SEALS, FISH, AND GIANT SQUID - ITS THROAT IS SO LARGE THAT A MAN COULD FIT THROUGH IT.
24. TRUE· THE NARWHAL IS A TOOTHED WHALE WITH TWO TEETH; THE LEFT ONE (OFTEN IN MALES, OCCASIONALLY IN FEMALES) GROWS INTO A TUSK EIGHT OR NINE FEET LONG.
25. FALSE· MOST FEMALE WHALES PRODUCE ONLY ONE CALF EVERY OTHER YEAR (GESTATION IS ALMOST A YEAR, AND THE CALF STAYS WITH ITS MOTHER DURING ITS FIRST YEAR OF LIFE). ONCE WHALES HAVE BEEN HUNTED IN A CERTAIN AREA, THEY WILL NOT RETURN FOR A LONG TIME. MANY WHALES HAVE BEEN HUNTED ALMOST TO EXTINCTION.
26. TRUE· IMMEDIATELY AFTER IT IS BORN, THE MOTHER MUST HELP IT TO THE SURFACE FOR ITS FIRST BREATH OF AIR.
27. FALSE· SPERMACETI AND AMBERGRIS ARE SUBSTANCES OBTAINED FROM WHALES AND USED IN MAKING PERFUME, CANDLES, COSMETICS, AND MEDICINES. "BELUGA" IS A TYPE OF WHITE WHALE THAT LIVES IN ARCTIC WATERS.
28. FALSE· ALTHOUGH THEY HAVE NO EXTERNAL EAR FLAPS AND THE OPENINGS TO THEIR "EARS" ARE ONLY A FRACTION OF AN INCH IN DIAMETER, THEY HAVE AN EXCEPTIONALLY KEEN SENSE OF HEARING.
29. TRUE· THIS LEAPING IS KNOWN AS "BREACHING".
30. TRUE· ONE 80' BLUE WHALE WAS FOUND TO HAVE TWO TONS OF KRILL IN ITS STOMACH; THE STOMACH OF A SPERM WHALE WAS FOUND TO CONTAIN 75-100 SQUID, THREE TO FOUR FEET IN LENGTH.

① 

A WHALE MOVES FORWARD BY SWISHING ITS FLUKES FROM SIDE TO SIDE.

②

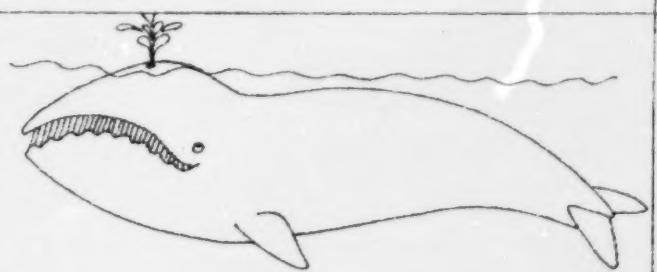
A WHALE'S EYES ARE CONSTANTLY SHEDDING TEARS.

③ 

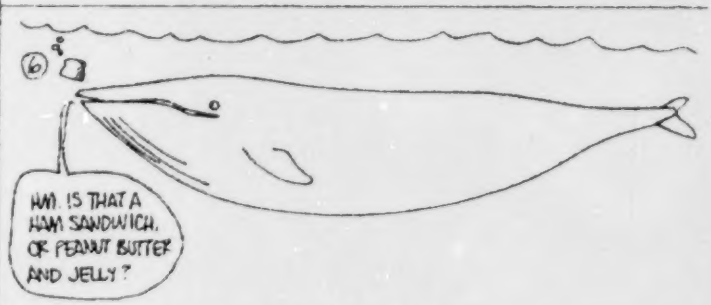
GRAY WHALES MIGRATE TEN THOUSAND MILES EACH YEAR.

④

WHALES SLEEP WITH THEIR BODIES RESTING ON THE OCEAN FLOOR.

⑤ 

A WHALE "SPOUTS" BY FORCING WATER OUT OF ITS BLOWHOLE.

⑥ 

WHALES HAVE NO SENSE OF SMELL.

⑦

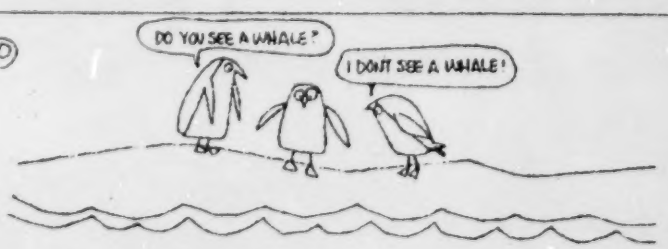
THE ONLY ENEMY OF THE GREAT WHALES IS THE SWIFT, DEADLY KILLER WHALE.

⑧

ALTHOUGH WHALES BREATHE AIR, THEY ARE LIKELY TO SUFFOCATE IF TAKEN FROM THE WATER.

⑨

A NEWBORN BLUE WHALE WEIGHS TWO TONS.

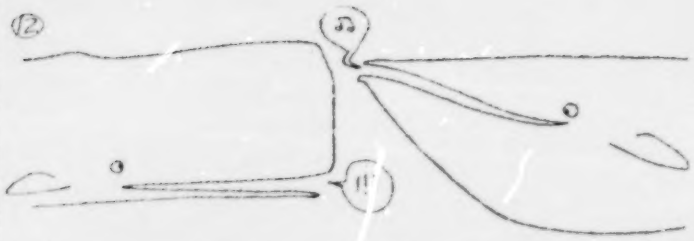
⑩ 

THERE ARE NO WHALES IN ANTARCTICA.

(11)

A WHALE'S BLUBBER ACTS AS INSULATION AND A RESERVE FOOD SUPPLY, AND HELPS KEEP THE WHALE AFLOAT.

(12)

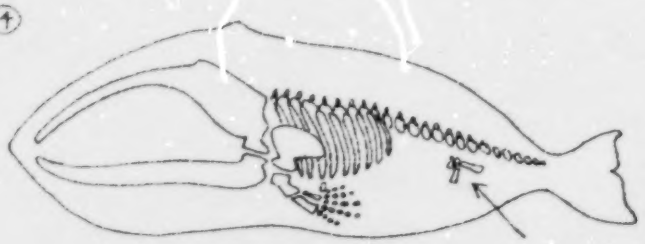


THE WHALES' COMMUNICATION WITH EACH OTHER, USING CLICKING AND "SINGING" NOISES, IS KNOWN AS "SOUNDING".

(13)

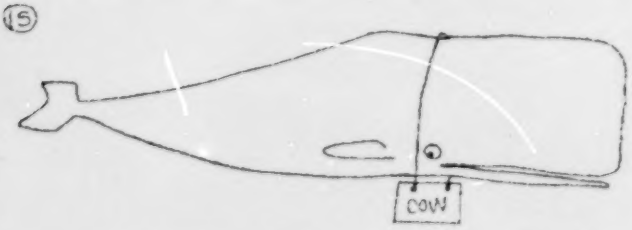
THE ONLY ANIMAL LARGER THAN THE BLUE WHALE WAS THE BRONTOSAURUS.

(14)



SOME WHALES HAVE TINY LEG BONES INSIDE THEIR BODIES.

(15)



MALE WHALES ARE CALLED BULLS, FEMALES ARE CALLED COWS, BABIES ARE CALLED CALVES, AND GROUPS OF WHALES ARE CALLED HERDS.

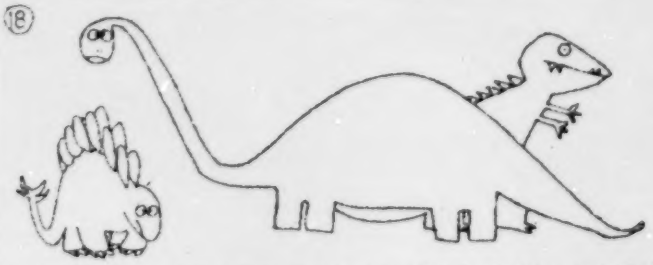
(16)

AN ADULT BLUE WHALE WEIGHS ABOUT 75 TONS.

(17)

YOU CAN IDENTIFY DIFFERENT TYPES OF WHALES BY THE WAYS THAT THEY SPOUT.

(18)



LIKE THE DINOSAURS, WHALES HAVE SMALL, POORLY DEVELOPED BRAINS.

(19)

WHALES CAN DROWN.

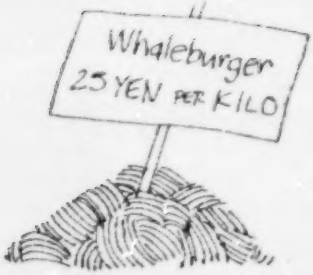
(20)

A WHALE'S BLOWHOLE IS NOT CONNECTED TO ITS MOUTH

(21)

ALL WHALES HAVE TEETH.

(22)



WHALE MEAT IS A POPULAR FOOD IN JAPAN.

(23)

THE 100' BLUE WHALE HAS A MUCH LARGER THROAT THAN THE 70' SPERM WHALE

(24)

THE NARWHAL'S LONG TUSK IS ACTUALLY A SPECIALIZED TOOTH.

(25)

SINCE WHALES MULTIPLY SO QUICKLY, THERE IS LITTLE DANGER THAT THEY WILL EVER BECOME EXTINCT.

(26)

A WHALE CALF IS BORN TAIL FIRST

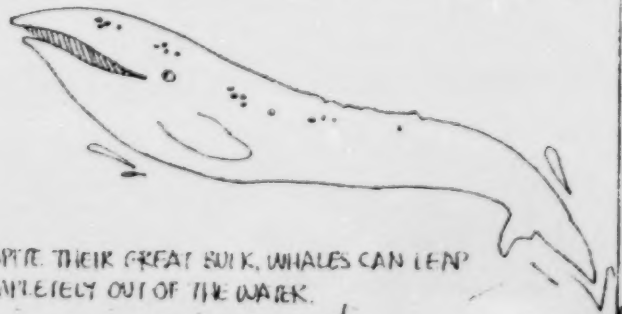
(27)

SPERMACETI, AMBERGRIS, AND BELUGA ARE ALL PRODUCTS THAT WE GET FROM WHALES.

(28)

WHALES ARE NEARLY DEAF.

(29)

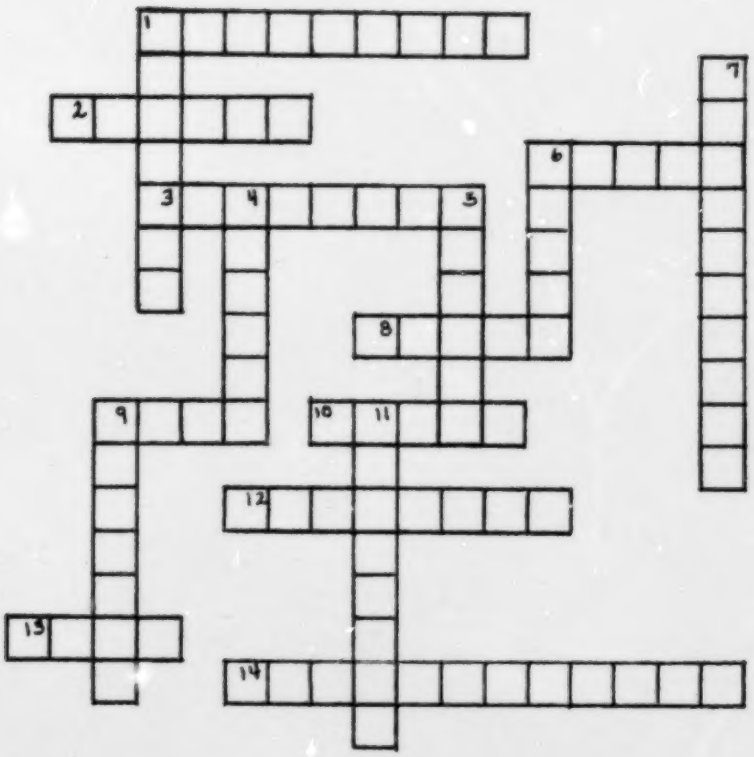


DESPITE THEIR GREAT BULK, WHALES CAN LEAP COMPLETELY OUT OF THE WATER.

(30)

THE LARGE WHALES OFTEN EAT A TON AND A HALF OF FOOD PER DAY.

Whale Crossword Puzzle



Use these words:

Gray
Beluga
marine
plankton
echolocation
endangered
dolphin
Pilot
cetacean
squid
dorsal fin
Blue
spout
Sperm
Bowhead
Humpback
Killer

ACROSS:

1) The part of a whale's body which helps to maintain balance and determine the speed it travels, is the _____ _____. (two words)

2) Another name for the "White Whale" is _____.

3) This whale is most famous for its songs and acrobatic ability.

6) A common food for the toothed whales, particularly the Sperm whale, is _____.

8) The _____ whale is a small whale, often living in herds as large as 100.

9) This whale's heart can weigh as much as 1,200 pounds.

10) The _____ whale has a small cavity in its forehead where it keeps a very precious oil called spermaceti.

12) The order of mammals made up of whales, dolphins and porpoises is called _____.

13) This whale travels 12,000 miles round trip every year along the California coast.

14) Whales depend on _____ to avoid obstacles. They do this by making ultra-sonic sounds which indicate the distance and direction of objects when bounced off of them.

DOWN:

1) The _____ is considered to be the whale's cousin.

4) The whale is not a land mammal, but rather a _____ mammal.

5) The _____ whale, also known as Orca, is the only whale that hunts in packs for food such as penguins, seals, dolphins and other whales.

6) A _____ is vaporized air which is blown out of the blowhole everytime the whale surfaces to breathe.

7) The "Right Whale" is the most _____ of all the whales.

9) The "Greenland Right Whale" is also called _____ because of its arched, bow-shaped head.

11) _____ are floating masses of tiny plant and animal matter eaten by baleen whales.

Prepared by: Peninsula Humane Society
Education Department
12 Airport Blvd.
San Mateo, CA. 94401
573-3720

WHALE MOBILE

The Whale Mobile is a fun art activity to be used as a a follow-up to our whale presentation. There are two ways you can use the Whale Mobile: (1) the attached can be used as an original for duplication by xerox or stencil, or (2) you can cut out cardboard patterns for the children to trace.

INSTRUCTIONS:

1) Each child should receive two sheets for a total of seven whales.

2) Have children color whales. The use of books for proper color choices is a good idea. For a more attractive mobile, have the children color and draw in eyes, mouth, fins, and barnacles on the reverse side of each whale for a double effect.

3) Cut each whale out and punch holes in the indicated places. Be sure children do not punch holes too close to the edges.

4) Cut strings to desired lengths and attach to whales. Use numbered chart on Whale Mobile for proper placement of whales.

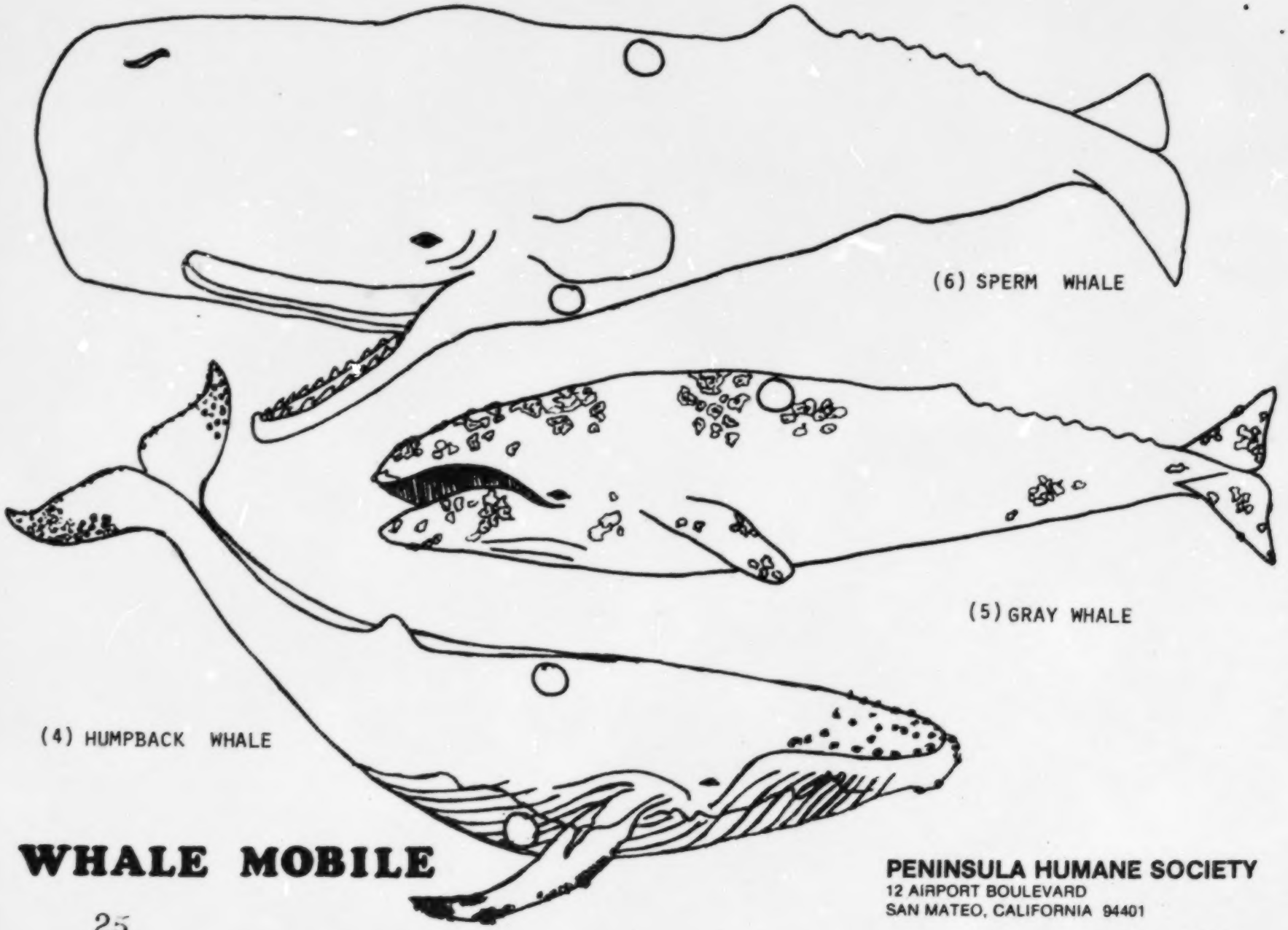
5) Attach whales to coat hangers.

6) For easy identification, children can write (in small print) the name of each whale on the tail flukes.

MATERIALS NEED:

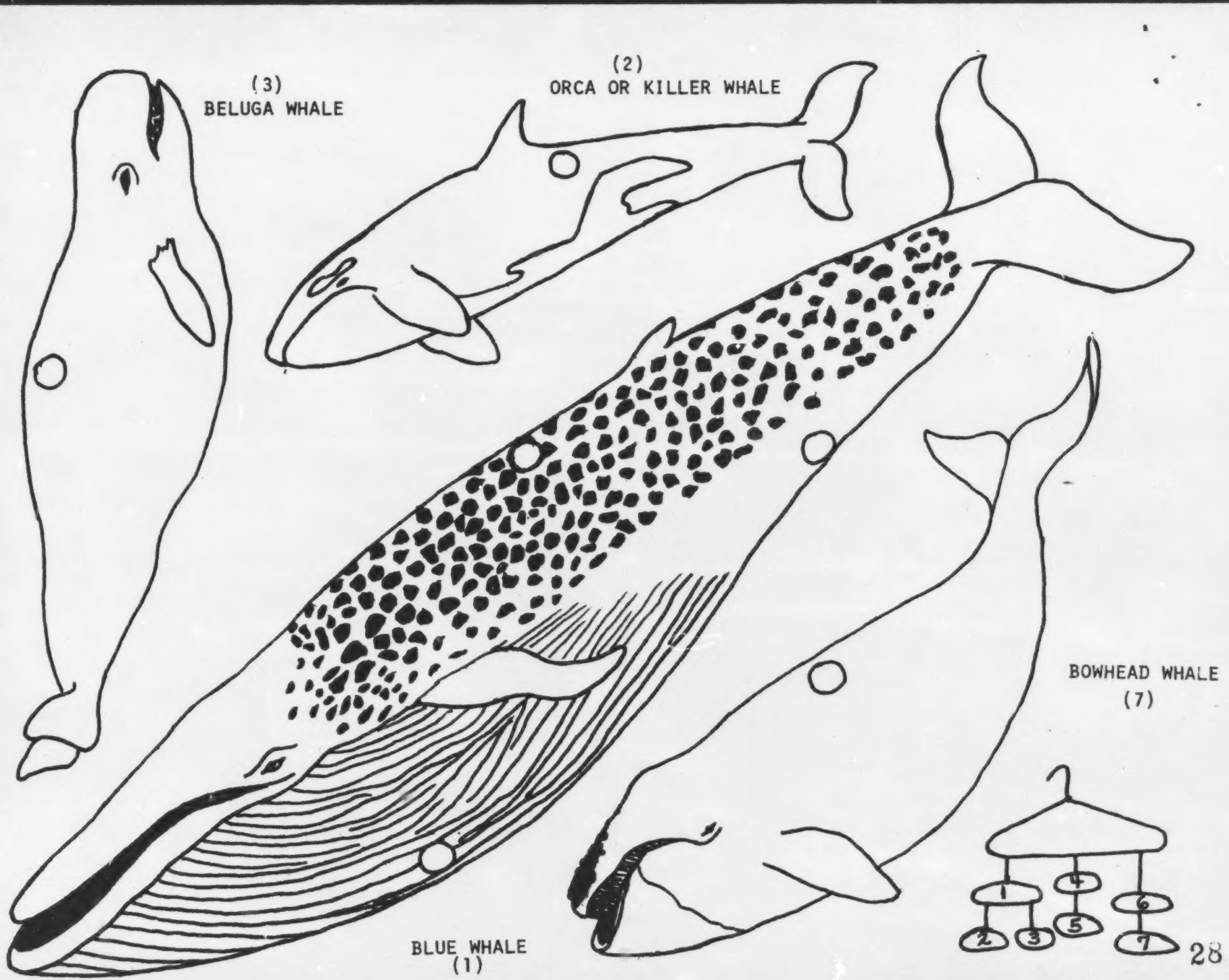
- coat hanger (preferably wire kind)
- string
- hand hole puncher
- scissors
- coloring crayons or pencils

Prepared by: Peninsula Humane Society, Education Department
12 Airport Blvd, San Mateo, CA. 94401



WHALE MOBILE

PENINSULA HUMANE SOCIETY
12 AIRPORT BOULEVARD
SAN MATEO, CALIFORNIA 94401


(3)
BELUGA WHALE
(2)
ORCA OR KILLER WHALE
BOWHEAD WHALE
(7)
BLUE WHALE
(1)
1
4
6
2
3
5
7

HOW IS YOUR WHALE VOCABULARY ?

MATCH THE WORDS AND MEANING

1. BALEEN _____
2. MIGRATION _____
3. CETACEAN _____
4. BULL _____
5. BLOW HOLE _____
6. ORCA _____
7. KRILL _____
8. CALF _____
9. FLUKE _____
10. POD _____
11. SPOUTING _____
12. ENDANGERED _____
13. COW _____
14. BLUBBER _____
15. BREACHING _____
16. HARPOON _____

A. A MEMBER OF THE ORDER OF MAMMALS MADE UP OF WHALES, DOLPHINS AND PORPOISES

B. NOT MANY LEFT

C. ANOTHER NAME FOR THE KILLER WHALE

D. HORNY PLATES IN THE MOUTH THAT STRAIN OUT FOOD FROM WATER

E. A BABY WHALE

F. THE ACT OF EXHALING AIR THROUGH THE BLOW HOLE

G. NOSTRILS LOCATED ON THE TOP OF THE HEAD

H. THICK LAYER OF FAT BETWEEN THE SKIN AND MUSCLE. IT IS USED TO MAKE CRAYONS, SHOE POLISH, LIPSTICK, PET FOOD, MARGARINE, ETC.

I. TRAVELING FROM ONE PLACE TO ANOTHER EVERY YEAR

J. A FEMALE WHALE

K. A HORIZONTALLY FLAT TAIL

L. SMALL ORGANISMS WHICH THE NON-TOOTHED WHALES FEED ON

M. A MALE WHALE

N. A TORTUROUS WEAPON USED TO KILL WHALES

O. GROUP OF WHALES

P. WHEN A WHALE LIFTS IT'S BODY OUT OF THE WATER

PENINSULA HUMANE SOCIETY, 12 AIRPORT BLVD., SAN MATEO, CA. 573-3720

WHALES: SOME INTERESTING FACTS

CETACEANS

Whales are members of the Cetacean order. Cetaceans are an order of mammals made up of whales, dolphins and porposises. Cetaceans live entirely in the water and breathe air through lungs. Their fishlike bodies have a thick layer of fat called blubber that keeps them warm. Cetaceans have flippers for front limbs and no hand limbs. They almost have no hair.

Whales are the largest animals that ever lived (much larger than the prehistoric dinosaurs). The Blue whale may weigh 150 tons. Whales live in oceans and look much like fish, but are not. They are mammals like humans, dogs, cats, horses, etc. They have horizontal tail fins (fish have vertical tail fins).

Whales are warm-blooded, so their blood stays at the same temperature such as in humans. Cold-blooded temperature adapts to the environment such as happens with fish. Their body temperature changes according to the temperature of the water in which the fish is swimming.

CHARACTERISTICS OF WHALES

1. warm-blooded
2. horizontal tail fins
3. breathe oxygen through lungs (not through gills like fish do)
4. largest animal ever
5. bear live young and nurse them
o. may be identified from their spout

TWO MAIN TYPES OF WHALES

Toothed Whales: Have teeth enabling them to catch and eat fish, squid and other creatures in the sea. The teeth are used for grasping the prey, which is then swallowed. There are 65 different species of toothed whales.

I. Toothed Whales
   A. Great Whales
      1. sperm whale
   B. Small Whales
      1. killer whale (orca)
      2. pilot whale
      3. narwhale
      4. beaked whale
      5. white whale (beluga)

TWO MAIN TYPES OF WHALES (CONT.)

Baleen Whales: No teeth, but have thick hairlike plates which hang from the upper jaw to strain out food from the water. These plates are called baleen or whalebone. Baleen whales eat plankton which is tiny krill, crabs, worms and other organisms that live in the sea. The whales take in a huge mouthful of water, containing the plankton, then use their tongues to push the water out through the baleen. The plankton remains in the whale's mouth. There are over 10 different species of baleen whales. The baleen whales have undertaken two different lines of specialization in feeding: the rorquals, which have small filter plates and are very streamlined and the non-rorquals which have developed an enormous head with very large filter plates and are less streamlined.

II. Baleen Whales
- A. Rorqual Great Whales
  1. blue whale
  2. fin whale
  3. sei whale
  4. byrde's whale
  5. minke whale
- B. Non-Rorqual Great Whales
  1. bowhead whale
  2. right whale
  3. humpback whale
  4. gray whale

SIMILARITIES BETWEEN HUMANS AND WHALES

A. Both are Mammals
1. Warm-blooded (whales temperature is 92^{o} and humans is 98.6^{o})
2. Vertebrates
3. Body hair
4. Bear live young
5. Nurse the young with their milk
6. Breathe oxygen with lungs
7. four chamber heart

B. Social Organization
1. Both live in groups: human group is called a family and a whale group is called a pod
2. Mothers care for their young for several years, until they are able to fend for themeselves
3. Both have sophisticated means of communication

C. Bone Structure
1. Hand bones of humans and bones of whale flippers are similar (see enclosed illustration)
2. Whales have vestigal hind legs becuase they used to be land animals
3. Humans have a tail bone compared to a whale's tail
4. General skeletal structure is similar between humans and whales

WHALES: SOME INTERESTING FACTS (CONT.)

SIZE OF WHALES

Whales come in various sizes. The blue whale is the largest and may reach over 100 feet in length. The fin whale grows up to 80 feet, and the humpback only measures about 40 feet. Minke whales are small, about 30 feet, just like the orca or killer whale. (See enclosed whale chart for size comparison).

BEHAVIOR

Whales live much like people do. They are warm-blooded and breathe air. They bear their young alive and nurse them. They live in family groups, communicating by sounds. They have highly developed brains, and their intelligence has only recently been explored by scientists. The size of whale brains, both proportionally and absolutely, are the largest and among the best developed of all living creatures. The brain of the sperm whale is perhaps the most complex of all living things, including people. The sperm whale brain has more convolutions (usually accepted as a rule-of-thumb indication of intelligence) than a human's brain.

COMMUNICATION

Whales call to each other in the sea with a variety of sounds. Some make what sounds to us as grunts and clicks. Others, like the humpback, have an intricate "song". Musicians have used the sounds of whales recently in making of records and writing songs.

SLEEPING

Whales do not sleep at night like people, they have to stay awake to breathe all the time, so they take short naps. When a whale sleeps, another stays awake to make sure they are breathing.

WHALES: SOME INTERESTING FACTS (CONT.)

BREATHING

Whales breathe like people. But because they live in the water, they have their nostrils on top of their heads. These nostrils are called blowholes. They shut their blowholes when they go under water. They have to remember to breathe! Whales come to the surface to breathe about every 15 minutes. Before a whale takes in fresh air, it blows out the stale air from its lungs through its blowhole on top of its head (baleen whales have two blowholes and toothed whales have one).

EYESIGHT

Whales "see" with their ears more than with their eyes. Although they do have good eyesight above water, it is impossible to see deep in the ocean where there is no sunlight. Whales see by listening to sounds that bounce off objects around them. They listen to echos from the clicks to tell where they are and what is in their way. This is echolocation. Whales can see as well with sound as we do with sight.

MIGRATION

The Gray whale has the longest migration route presently known to scientists. Each year the Gray whale swims nearly 12,000 miles from the cold waters of the Artic to warm waters off the coast of Mexico. In the Artic waters the whale finds the food it needs to build up blubber and energy for the journey south. In the warm waters, Gray whales give birth to their babies. The calves will nurse for nearly a year to accumulate a thin layer of blubber, and then, they too, begin the long swim northward.

BIRTH OF THE WHALE

Young whales are born in the water. After they are helped to the surface for a breath of air, they begin feeding. The mother's milk is squirted down the young whales throat. In large whales such as the Blue whale, the young can consume 130 gallons of milk a day! They can gain up to 200 pounds a day, reaching a length of 50 feet in one year. The young stay with the female for 7 to 12 months depending on the species.

WHALING

People are the whale's greatest enemy. Unfortunately for the whale, it contains numerous products that are of value to people. Whale oil is used in soap, margarine, candles, cosmetics and for industrial and medical purposes. However, today there are suitable, and often superior replacements for every whale product. In the 1800's almost every nation hunted whales. Baleen and whale oil were the chief products taken by the whalers. Today, Japan and Russia are the two major whaling nations.

WHALES: SOME INTERESTING FACTS

DID YOU KNOW.....

- Whales evolved over 30 million years ago
- Whales are the largest creatures on earth
- Whales cruise at about 6 knots an hour....about twice as fast as a person walks
- Whales keep salt water out of their eys by "crying" oily tears
- Six men can sit easily inside the mouth of a Blue whale
- When a baby whale is born, an "aunty", another female whale is there to help
- Different species of whales can be identified by their "geyser" spouts
- A group of whales is called a pod
- Whales travel in herds, often migrating year after year to the same areas
- The blue whale is the largest of all whales:
  - *Longer than 30 elephants
  - *It weighs more than 2,000 people
  - *Its heart weighs 1200 pounds
  - *Its tongue weighs 1/3 ton
  - *Some arteries are so large a small child could crawl through them
  - *A newborn calf weighs 2 tons and is 25 feet long
- The brain of the sperm whale is, perhaps, the most complex brain ever evolved on earth. And there is no doubt that these complicated brains are used for intelligent, complex communications

WHALE ACTIVITY SUGGESTIONS

I. LANGUAGE ARTS

A. SONAR: Have your students look up the word "sonar" in the dictionary. Humans, by watching whales, have learned how to make machines that do what whales do with their bodies and their brains. "Sonar" is a machine on a ship that does what a whale does, and enables the crew to guide the ship through the water where human eyes cannot see.

B. RESEARCH: Research the reasons why so many whales are endangered. What can be done to save them? What can your students do to help? Maybe they can write letters, or get petitions signed (see enclosed petition).

C. DEBATE: Have a two minute debate on "Should People be Allowed to Kill Whales".

D. WRITING: Read and discuss "A Letter From a Whale" (included in this unit). Have the students write an answer to the whale's letter.

E. WRITING: Write a dialogue between the first human and the first whale to achieve interspecies communication through the aid of a special translating computer. What do we want to know about the lives of whales? What do the whales want to know about our lives?

II. SCIENCE

A. RESEARCH: Assign each student a different whale or dolphin to research. Have them research which ones are endangered and why. If some are being hunted by people, what are they killed and used for? This is a good class project to give the group an overall picture of the different kinds of whales there are and what their status is.

B. WHALE PRODUCTS: Indentify the variety of products made from whales. Suggest alternatives to each. Pretend you are a wildlife protection group and make posters encouraging people to save the whales by not buying whale products.

C. ENVIRONMENTAL NEEDS: List environmental needs of whales: food, clean water, room to swim, safe areas in which to bear their live young. How have humans affected these needs? Example: polluted oceans, oil spills, invasion of calving areas by whalers, and tourists. How can we help? Example: setting up whale sanctuaries (as for humpbacks near Hawaii), keep boats away from calving areas and migration routes (as for gray whales near Baja, California).

III. MATH

A. The size of a blue whale is impressive. At 150 tons, the whale weighs 300,000 pounds. Ask the students to find out the weight of all your students combined and compute how many students it would take to approximate the weight of a blue whale.

B. A young blue whale can gain 200 pounds in a day. It can go through 130 gallons of milk per day. Can your students suggest a way to get a clear idea of how much milk this is? (If the milk were in half-gallon cartons,stored in cases each holding nine half-gallons, how big a space would this much milk occupy?)

C. Measure the classroom. How many classrooms would be needed to accommodate a blue whale?

D. Construct a playground chalk drawing of a life-size blue whale 100' long. How many students can fit inside the drawing? How much do all of you weigh together? How much does a blue whale weigh if it weighs 150 tons? One ton equals 2,000 pounds.

E. If a blue whale eats 8 tons of krill per day, how much will it eat in a week? A year? If the whale weighs 95 tons what percent of its body weight does it consume in food each day?

F. If the tongue of a blue whale weighs 1/3 ton, how many pounds does it weigh?

IV. SOCIAL STUDIES

A. GEOGRAPHY: Use a world map to identify the major breeding grounds and migration route of the California Gray whale.

B. PROTECTION OF WHALES: Discuss with your class the responsibility we have to the whales. Are we responsible for protecting them? Discuss the ways the students can help whales.

V. ART/MUSIC

A. Draw pictures or make clay models of a whale, showing the blowhole, flukes, dorsal fin, flipper and mouth

B. Design a whale conservation poster and a "save a whale" bumpersticker

C. Have your students make posters on the plight of the whale. Hang the posters in your school or send them to the Peninsula Humane Society to be hung in our Humane Education Room.

D. Listen to the song of the humpback whale. How does this music compare to our own? Call Peninsula Humane Society at 573-3719 to borrow a tape of the humpback whale song.